Appl. No. 10/618,455
Amdt. dated December 27, 2006
Reply to Office Action of June 27, 2006

PATENT

REMARKS/ARGUMENTS

Claims 1-51 and claims 53-63 were pending. Upon entry of this amendment, claims 1, 5, 9, 12-16, 20, 21, 24, 27, 28, 32, 38-45, 49, 53, 57, and 61 are amended, leaving claims 1-51 and claims 53-63 pending consideration. Claims 1-13 and 27-51 stand rejected under 35 U.S.C. §112, second paragraph. Under 35 U.S.C. §102(b), claims 1-3, 7, 8, 14, 15, 24, 26, 27, 35, 38-42, 45-47, 49, 50, and 53-55 stand rejected as being anticipated by U.S. Patent No. 5,425,050 issued to Schreiber (hereinafter "Schreiber"), claims 1-3, 7, 12-14, 16, 24, 38-42, 45-49, and 53-56 stand rejected as being anticipated by U.S. Patent No. 5,917,852 issued to Butterfield et al. (hereinafter "Butterfield"), and claims 1, 2, 5, 7, 12-14, 16, 24, 27, 38-49, and 53-56 stand rejected as being anticipated by U.S. Patent No. 6,677,684 issued to Khayrallah (hereinafter "Khayrallah"). Under 35 U.S.C. §103(a), claims 2, 3, 27-29, 35, 37, 49-51, and 57-63 stand rejected in view of Butterfield, claims 1, 2, 4-6, 8-10, 12-14, 17, 18, 21, 24, 25, 27, 28, 32, 35, 36, 38-47, 49, 50, 53-55, 57-59, 61, and 62 stand rejected as being anticipated by U.S. Patent No. 6,012,159 issued to Fischer et al. (hereinafter "Fischer"), and claims 1, 2, 4-10, 12-14, 17, 18, 21-28, 32-47, 49, 50, 53-55, 57-59, 61, and 62 stand rejected under 35 U.S.C. §103(a) in view of U.S. Patent No. 6,081,907 issued to Witty et al. (hereinafter "Witty"). Claims 19 and 56 are allowable if rewritten in independent form. Claims 11, 30, and 31 are allowable if rewritten to over come rejections under 35 U.S.C. §112, second paragraph. Claims 14 and 20 stand rejected under non-statutory obvious-type double patenting.

Applicants aver that no new matter has been added in this response.

§112 Rejections

In the Office Action, the Examiner rejected claims 1-13, and 27-51 under 35 U.S.C. §112, second paragraph. Applicants have amended claims 1, 27, 38, 45, 49, and 57 to more clearly recite the claimed subject matter and submit the rejections are now moot.

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Obvious-type double patenting

In the Office Action, the Examiner rejected 14 and 20 under non-statutory obvious-type double patenting over co-pending patent application number 10/267,573. Applicants have submitted a properly signed terminal disclaimer herewith and submit the rejections are now moot. Applicants noted co-pending patent application number 10/267,573 should be 10/367,573. The attached Terminal Disclaimer has been updated accordingly.

§102 /§103 Rejections

Claims 1, 14, 27, 38, 45, 49, 53, 57, 61

In the Office Action, under 35 U.S.C. §102(b) the Examiner rejected claims 1-3, 7, 8, 14, 24, 26, 27, 35, 38-42, 45-47, 49, 50 and claims 53-55 as being anticipated by Schreiber, rejected claims 1-3, 7, 12-14, 16, 24, 27, 38-42, 45-49 and 53-55 as being anticipated by Butterfield, and rejected claims 1, 2, 5, 7, 12-14, 16, 24, 27, 38-49, and 53-56 as being anticipated by Khayrallah, Under 35 U.S.C. §103(a), the Examiner rejected claims 2, 3, 27-29, 35, 37, 49-51, and 57-63 as being obvious in view of Butterfield, rejected claims 1, 2, 4-6, 8-10, 12-14, 17-18, 21, 24, 25, 27, 28, 32, 35, 36, 38-47, 49, 50, 53-55, 57-59, 61, and 62 as being obvious in view of Fischer, and rejected claims 1, 2, 4-10, 12-14, 17-18, 21-28, 32-47, 49-50, 53-55, 57-59, 61-62 as being obvious in view of Witty.

The Examiner states that Schreiber discloses information additive code by broadcasting to a plurality of receivers using coding techniques of FEC, spread spectrum, and OFDM, where the PN sequence generator of Schreiber operates such that the information additive code transmitted at any particular time is independent of the information additive code previously received as the PN sequences are pseudo-random pointing to Figures 6, 7, and 9 *et seq.* of Schreiber. Applicants respectfully traverse the rejections.

Schreiber discloses a broadcast system that distributes television video television signals to one or more receivers using spread spectrum and OFDM to improve transmission reliability. Schreiber can only reconstruct content associated with transmissions where enough output symbols have been received from among the output symbols generated in the original

transmission. Schreiber cannot reconstruct content for transmissions where not enough output symbols have been received in the original transmission without retransmission of some or all of the output symbols. In contrast, using information additive codes to generate the output symbols as claimed, if not enough output symbols are received to reconstruct the content in the original transmission, a new second set of output symbols can be generated and sent in a second transmission that are independent of the first set of output symbols, and any output symbols received from the second set can be efficiently combined with any output symbols received from the first set to reconstruct the content.

Schreiber discloses a transmission system that generates two data streams, one analog and one digital, from a single video data steam. The analog data stream undergoes spread spectrum processing via a spread-spectrum encoder which employs pseudorandom PNs of length N to produce a complex analog signal output. The digital signal is processed by a digital encoder to produce a complex digital output. The complex digital signal and complex analog signal are added together to generate hybrid output symbols having the form of a+jb. The hybrid output symbols are then processed by an OFDM encoder which generates a N-wide word that is converted to a serial data stream at baseband. The baseband data stream is shifted in frequency and transmitted by a modulator to one or more receivers at a desired transmission frequency. The receivers reverse the process to decode the transmission. The baseband data stream is transmitted and received in such a manner that under ideal conditions each of the hybrid output symbols transmitted would be identically reproduced by the decoder and in the same order i.e., the hybrid output symbols and their order making up the input data stream to the OFDM encoder would be identical to the hybrid output symbols and their order making up the output data stream of the OFDM decoder (see Schreiber col. 4 line 50 through col. 5 line 2).

Schreiber is directed to a fundamentally different process than is claimed. For example, claims 1 and 27 as amended recite in part "one or more information additive code transmitters configured to broadcast output symbols generated from information additive codes to a plurality of information additive code receivers...wherein the information additive code is such that a number of possible output symbols can be independent of a number of input symbols derived from [] source data...wherein the output symbols transmitted to the plurality of

information additive code receivers at any particular time is independent of the output symbols previously received by each of the plurality of information additive code receivers", claim 49 as amended recites in part "receiving a plurality of output symbols broadcast from one or more of a plurality of sources, the plurality of output symbols generated from information additive code, wherein the information additive code is such that a number of possible output symbols can be independent of a number of input symbols derived from the source data wherein the plurality of output symbols received at any particular time is independent of which of the plurality of output symbols was previously received", and claims 14, 38, 45, 53, and 57 recite in part "encoding source data into a plurality of output symbols using information additive code, wherein the information additive code is such that a number of possible output symbols can be independent of a number of input symbols derived from the source data", and claim 61 as amended recites in part "instruction code to receive a plurality of output symbols generated from source data using information additive code, wherein the information additive code is such that a number of possible output symbols can be independent of a number of input symbols derived from the source data". Schreiber does not disclose or suggest at least these elements.

In Schreiber, if any segment of the transmission from the modulator is not received (e.g. one or more hybrid output symbols are not received), Schreiber cannot reassemble the video content (e.g. reassemble a missing hybrid output signal) of the lost segment of video transmission from subsequent video transmissions without retransmitting the same data. In other words, a receiver receiving a transmission as disclosed in Schreiber would experience a loss of the video signal content as a result of a complete loss of a segment of the transmission. The spread spectrum, OFDM, and Reed-Solomon techniques disclosed in Schreiber apparently are used to help transmit the video signal such that the video content that is received can be reproduced even in areas of high cross-talk, multi-path distortion (intersymbol interference), and noise. Thus, Schreiber can only reconstruct content from received transmissions, but if not enough output symbols are received in the first set of output symbols generated and sent in the original transmission then Schreiber has no mechanism to independently generate a second set of additional output symbols and send those in a subsequent transmission, wherein any received output symbols from the second set can be combined with any received output symbols from the

first set to efficiently reconstruct the content. In addition, coordination between the transmitter and the receivers is implied as the same PN sequence used by the transmitter must be used by the receiver to recover the received transmission.

The Examiner states that Butterfield discloses arrangements of encoding and receiving a wireless transmission using coding techniques of variable FEC where the information additive code transmitted at any particular time is independent of the information additive code received due to the scramble patterns being pseudorandom pointing to Figure 11 *et seq.* of Butterfield. Butterfield is not directed to a broadcast system, but rather is directed to a point-to-point communication system which includes a base station independently communicating with individual receivers using a back-channel (reverse link). Butterfield does not disclose or suggest the transmission of the output symbols is done independent of what output symbols a receiver has received.

The Examiner states that Fischer and Witty disclose arrangements for encoding, satellite broadcasting, and decoding and information additive codes where the where the information additive code transmitted or received at any particular time is independent of the information additive code received pointing to column 3 *et seq.* of Witty and Figure 9 *et seq.* of Fischer. Fischer and Witty show a Reed-Solomon encoding scheme that relies on encoding K input symbols to generate N output symbols, where N>K. This is a conventional fixed rate (rate = K / N) coding scheme. As is well known in the coding arts, N cannot be too much larger than K because of coding complexities and losses of more than R = N-K symbols prevents complete recovery of the K input symbols.

In such forward error correction (FEC) encoding schemes, the number of output symbols ("N") relative to the number of input symbols ("K") not much larger and is fixed before encoding begins. The number of redundant output symbols, R= N-K, is therefore also fixed, so the transmitter needs to know or guess at a loss rate of the transmission link ahead of time. This leads to inefficiencies if the loss rate is overestimated, and can lead to failure to recover input symbols if the loss rate is underestimated. Thus, due to the estimation process and the need for redundant output symbols, both Fischer and Witty require some redundancy in transmission when the losses are greater than what was estimated.

In contrast, the claimed output symbol encoding is done so that the output symbols are encoded using information additive code such that they may be transmitted in order independent of the output symbols previously received by the receiver, and require no redundant transmission. As should be apparent, if the transmission of the output symbols is done independent of what output symbols a receiver received, different receivers having received different output symbols (because of transmission losses or because the receivers started listening at different times) can continue receiving the same stream and have the received output symbols be useful, without redundancy.

Thus, the Applicants submit that the claims 1, 14, 27, 38, 45, 49, 53, 57, 61 as amended are novel over Schreiber, Butterfield, Fischer, and Witty alone or in combination.

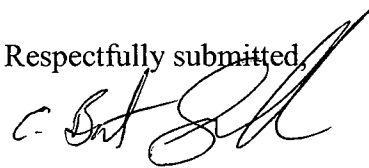Claims 2-13, 15-26, 28-37, 39-44, 46-48, 50-51, 54-56, 58-60, and 62

Claims 2-13 depend from claim 1, claims 15-26 depend from claim 14, claims 28-37 depend from claim 27, claims 39-44 depend from claim 38, claims 46-48 depend from claim 45, claims 50-51 depend from claim 49, claims 54-56 depend from claim 53, claims 58-60 depend from claim 57, and claim 62 depends from claim 61 are allowable for at least the same reasons as well as the limitations they recite.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

C. Bart Sullivan
Reg. No. 41,516

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: 415-576-0300
CBS:cbs

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